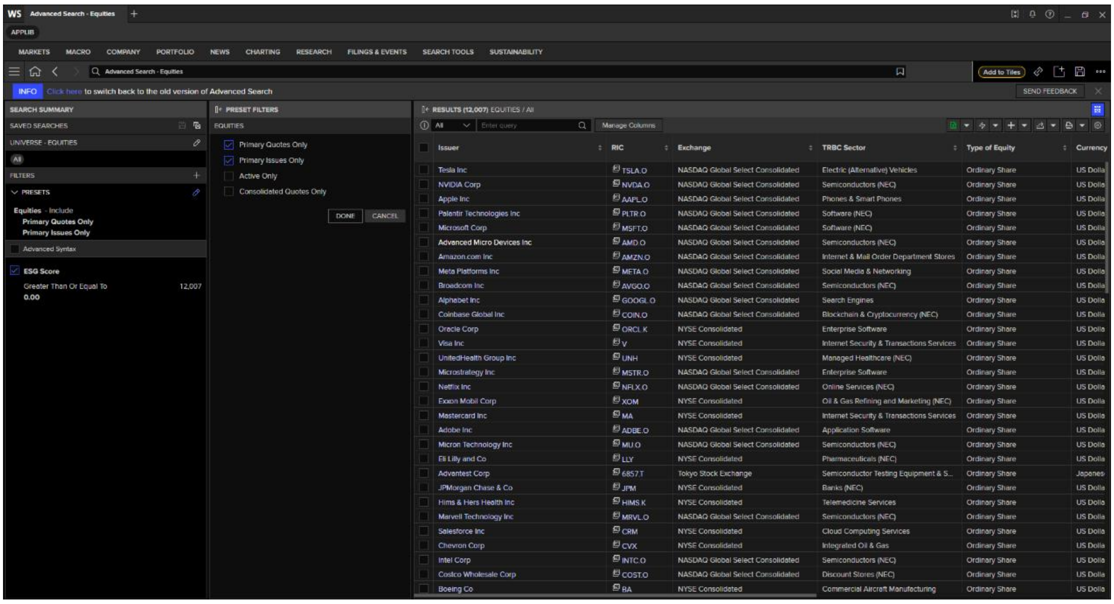
A Guide to data searching & Processing

The goal of this guide is to illustrate how to use the LSEG Workspace and its Excel add-in to identify cooperate bonds and CDS with ESG data and to obtain their prices and spreads as well as control data. Detailed instructions are provided below.

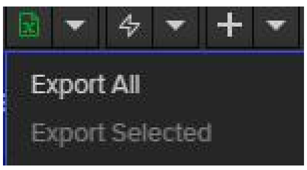
- **Equities:**

1. Open LSEG Workspace and locate the **Search Tools** header. Click **Equity Screener** or choose **Equities** under **Companies, Equities and Funds**.
2. Apply these filters:
   - ◆ PRESENT → Primary Quotes Only and Primary Issues Only (leave Active Only unticked—checking it does not affect the result, but it should remain unchecked).
   - ◆ ESG Score ⩾ 0.

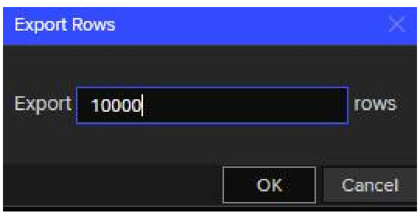


These settings return the list of firms with available ESG data.

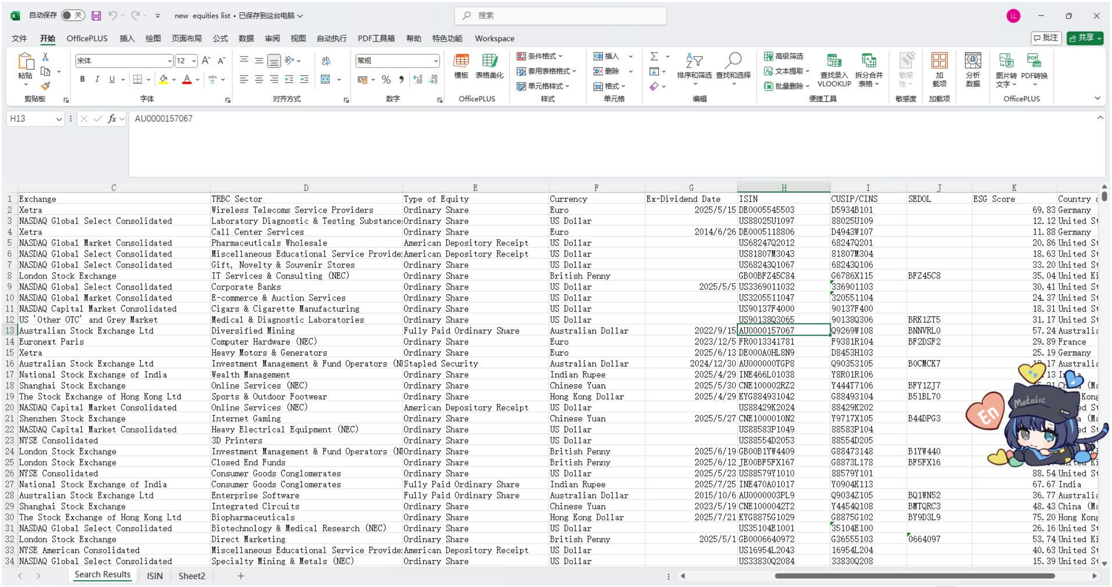
3. Download the list by clicking the green **Excel** icon in the upper-right corner.



Select **Export All** and set the limit to **10,000 rows**.



Note: Workspace allows a maximum of 10,000 rows per export. To stay within this limit, apply extra filters so each batch contains fewer than 10,000 firms, export each batch separately, and then combine the files. The quickest approach is to split the universe by issue dates, for example, export firms with issue dates on or before 31/12/2021, then those after 31/12/2021, and so on.

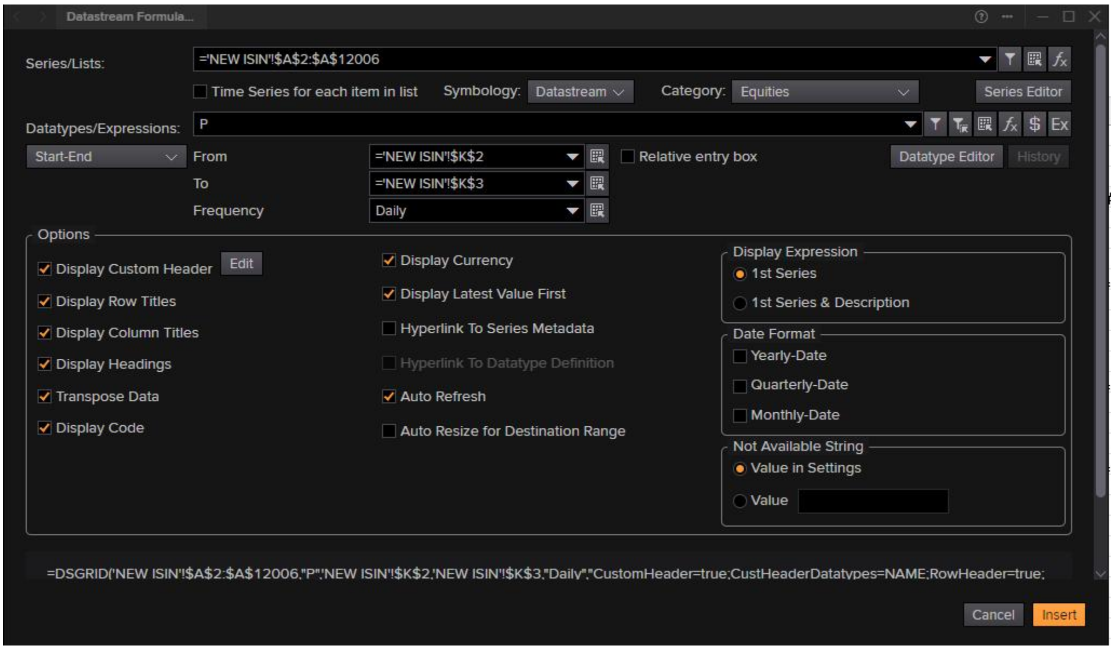


4. By this step you get all the list in the excel file like the figure below:

   Select the column of the ISINs, copy it to another sheet for data processing.

5. Use the **Datastream Formula** under Workspace (LSEG excel add-in) to obtain data easily.

The complete user guide can be found in the OneDrive folder **Guide for LSEG.** The Datastream formula I employ is outlined below.



Some Notes:

- Series – Paste all ISINs copied from the company list.
- Symbology – Select Datastream when using ISINs; otherwise, choose RIC.
- Datatype – P (Price), the required variable.
- Start / End – Specify the desired date range. From my experience, to reduce download errors, pull data in smaller blocks (e.g., 2025; 2022–24; 2019–21) and merge the files afterward, as LSEG can struggle with very large extracts.
- Options – Tick the boxes shown in the preceding screenshot.
- Date Format – Leave all boxes unchecked.

Put the formula in the first box of the excel, wait for a moment, then you can get the data you need. Copy the whole sheet, paste it to another sheet only with value to obtain the data.

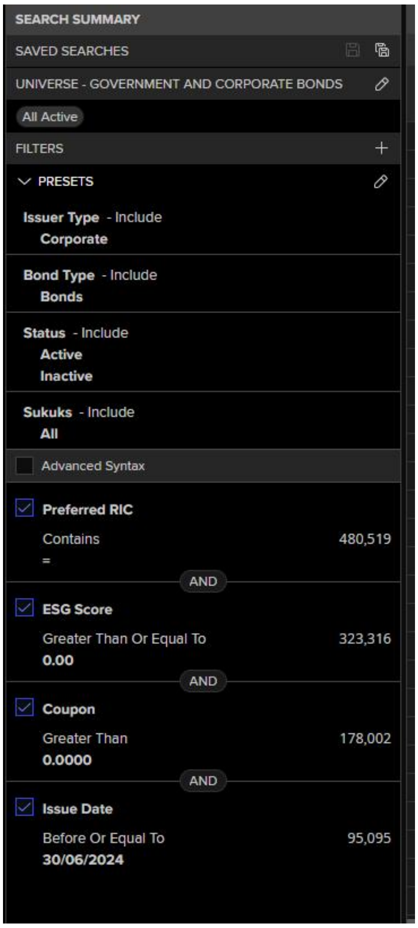
6. Combine the exported Excel files into a single workbook, merging the data by date.

- **One addition notes on equities:**

When you download an updated ISIN list, certain old ISINs may drop off because the equities have been delisted and no longer carry emissions data or an ESG score. These historical records are still valuable, so you should compare the old and new ISIN sets, identify any codes that are missing, and retrieve their prices using the steps above, provided LSEG still retains them in its database.

- **Bonds:**

1. Open LSEG Workspace and locate the **Search Tools** header. Click **Government and Coporate Bonds** under **Fixed Income**.
2. Execute The following filter to obtain the firm list and to download it, also by



split the issue dates. Then you obtain the list of the bonds.

Some Notes:

- **Preferred RIC:** Contains '=' to ensure each bond has a RIC so the data can be downloaded from Refinitiv Workspace.
- **ESG score**: Confirms that the issuer meets our ESG criteria.
- **Coupon**: Download bonds with coupons > 0 and coupons = 0 separately and chart them in different tabs: zero-coupon bonds are mostly issued by private banks with ESG scores, whereas coupon-bearing bonds cover all issuer types.
- **Issue date**: I filter for issues on or before 30/06/2024 to ensure at least one year of data per bond and to keep the result set manageable significantly

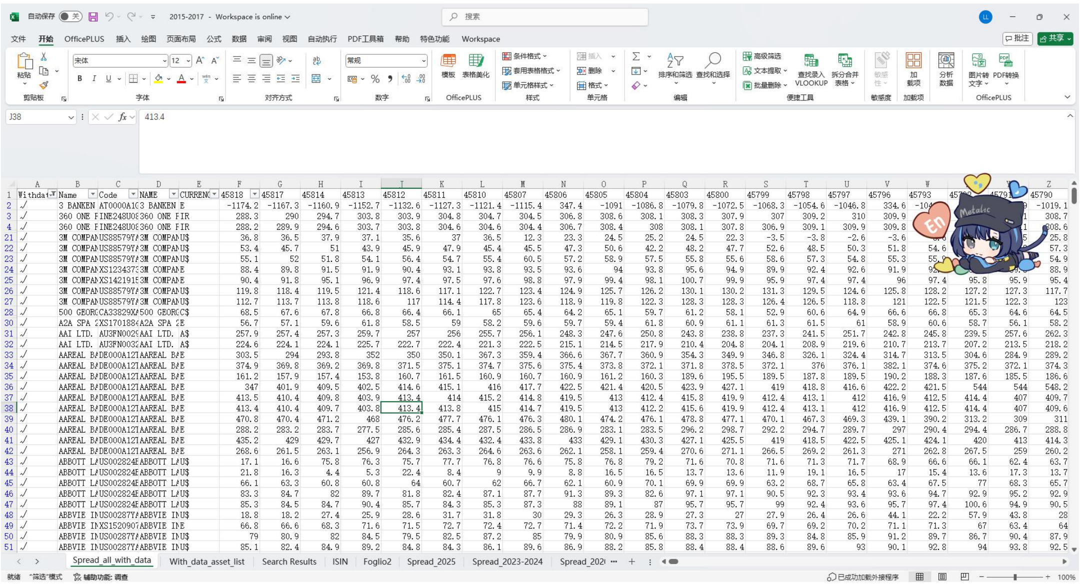
reducing the list of the bonds.

3. Download the bonds with its spread (code **SP**) and its price (code **CMPM**) respectively follow the same excel add-in formula with equities.
4. I will explain below how I process the raw bond data to consolidate everything into a single file together with the corresponding asset details.
   - **1.Combine files** – As we do for equities, we bring the assets from each file into a single workbook and merge the data year by year.
   - **2.Identify rows that contain data in LSEG** – To exclude assets that appear in the list but have no data in LSEG, we insert a new column in front of the list, name it "withdata", enter the formula below in cell A2, and copy it down the column:

     =IF(SUMPRODUCT(--ISNUMBER(F2:IKL2))>0," √ ","")

     The formula places a ✓ in the column whenever at least one numeric value exists anywhere in our period; otherwise the cell is left blank.
   - **3. Fill in missing identifiers:** Some bonds no longer display a value for the most recent year (2025) because they have matured or the download failed, even though historical data still exist; to ensure these rows remain on the asset list, first filter the withdata column (column A) for the √ symbol, then in the newest-date column on the far right (currently column F) filter for **no data available** The rows that remain are the bonds missing codes and names in 2025, and for each of these you should manually enter all missing fields (Name, Code, and Currency) after which the data set is complete.

     After this step the sheet should look like the graph below.



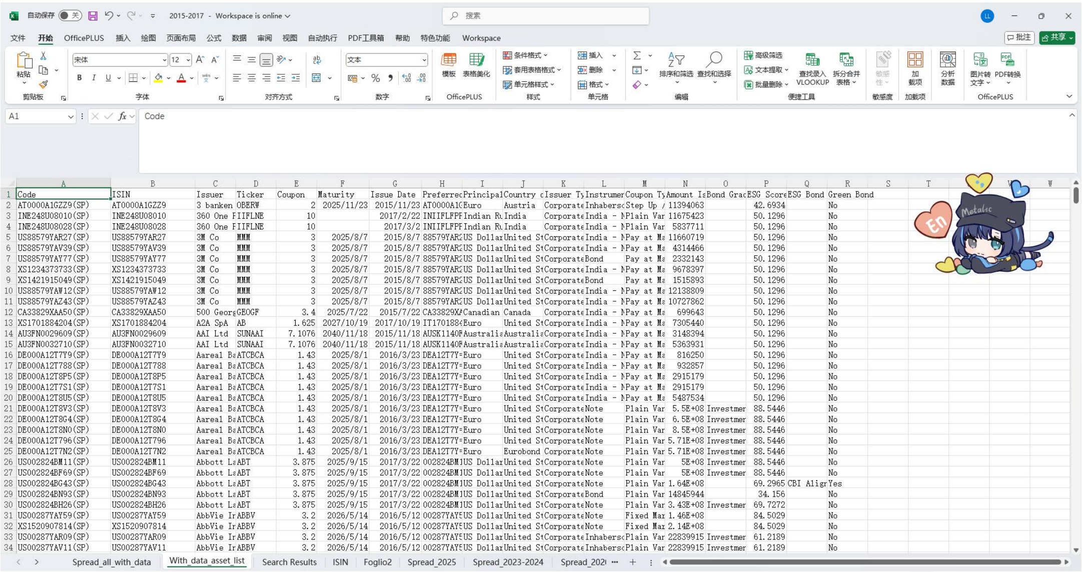
   - **4. Get the asset list:** Copy the Code column into the first column of a new sheet and, in cell A2, enter:

=TEXTBEFORE(A2,"(")

Because the original download adds “(SP)” after the ISIN, so this formula extracts the true ISIN or RIC. then obtain each asset’s details with a VLOOKUP function, e.g., in cell B3 enter:

=VLOOKUP(B2,'Search Results'!A2:AJ10000,2,FALSE)

and fill the formula down to produce the complete asset details for every



	Code	ISIN	Issuer	Ticker	Coupon	Maturity	Issue Date	Preferred	Principal	Country	Issuer Ty	Instrumer	Coupon Ty	Amount Is	Bond Grad	ESG Score	ESG Bond	Green Bond
2	AT0000A1GZZ9(SP)	AT0000A1GZZ9	3 banken	OBERW	2	2025/11/23	2015/11/23	AT0000A1G	Euro	Austria	Corporate	Inhabersc	Step Up /	11394063		42.6934		No
3	INE248U08010(SP)	INE248U08010	360 One F	IIFLNE	10		2017/2/22	INIIFLFPF	Indian Ru	India	Corporate	India - N	Plain Var	11675423		50.1296		No
4	INE248U08028(SP)	INE248U08028	360 One F	IIFLNE	10		2017/3/2	INIIFLFPF	Indian Ru	India	Corporate	India - N	Plain Var	5837711		50.1296		No
5	US88579YAR27(SP)	US88579YAR27	3M Co	MMM	3	2025/8/7	2015/8/7	88579YAR2	US Dollar	United St	Corporate	India - N	Pay at Ma	11660719		50.1296		No
6	US88579YAV39(SP)	US88579YAV39	3M Co	MMM	3	2025/8/7	2015/8/7	88579YAR2	US Dollar	United St	Corporate	India - N	Pay at Ma	4314466		50.1296		No
7	US88579YAY77(SP)	US88579YAY77	3M Co	MMM	3	2025/8/7	2015/8/7	88579YAR2	US Dollar	United St	Corporate	Bond	Pay at Ma	2332143		50.1296		No
8	XS1234373733(SP)	XS1234373733	3M Co	MMM	3	2025/8/7	2015/8/7	88579YAR2	US Dollar	United St	Corporate	India - N	Pay at Ma	9678397		50.1296		No
9	XS1421915049(SP)	XS1421915049	3M Co	MMM	3	2025/8/7	2015/8/7	88579YAR2	US Dollar	United St	Corporate	Bond	Pay at Ma	1515893		50.1296		No
10	US88579YAW12(SP)	US88579YAW12	3M Co	MMM	3	2025/8/7	2015/8/7	88579YAR2	US Dollar	United St	Corporate	India - N	Pay at Ma	12138809		50.1296		No
11	US88579YAZ43(SP)	US88579YAZ43	3M Co	MMM	3	2025/8/7	2015/8/7	88579YAR2	US Dollar	United St	Corporate	India - N	Pay at Ma	10727862		50.1296		No
12	CA33829XAA50(SP)	CA33829XAA50	500 Georg	GEOGF	3.4	2025/7/22	2015/7/22	CA33829XA	Canadian	Canada	Corporate	India - N	Pay at Ma	699643		50.1296		No
13	XS1701884204(SP)	XS1701884204	A2A SpA	AB	1.625	2027/10/19	2017/10/19	IT1701884	Euro	United St	Corporate	India - N	Pay at Ma	7305440		50.1296		No
14	AU3FN0029609(SP)	AU3FN0029609	AAI Ltd	SUNAAI	7.1076	2040/11/18	2015/11/18	AUSK1140F	Australia	Australia	Corporate	India - N	Pay at Ma	3148394		50.1296		No
15	AU3FN0032710(SP)	AU3FN0032710	AAI Ltd	SUNAAI	7.1076	2040/11/18	2015/11/18	AUSK1140F	Australia	Australia	Corporate	India - N	Pay at Ma	5363931		50.1296		No
16	DE000A12T7Y9(SP)	DE000A12T7Y9	Aareal Ba	ATCBCA	1.43	2025/8/1	2016/3/23	DEA12T7Y=	Euro	United St	Corporate	India - N	Pay at Ma	816250		50.1296		No
17	DE000A12T788(SP)	DE000A12T788	Aareal Ba	ATCBCA	1.43	2025/8/1	2016/3/23	DEA12T7Y=	Euro	United St	Corporate	India - N	Pay at Ma	932857		50.1296		No
18	DE000A12T8P5(SP)	DE000A12T8P5	Aareal Ba	ATCBCA	1.43	2025/8/1	2016/3/23	DEA12T7Y=	Euro	United St	Corporate	India - N	Pay at Ma	2915179		50.1296		No
19	DE000A12T7S1(SP)	DE000A12T7S1	Aareal Ba	ATCBCA	1.43	2025/8/1	2016/3/23	DEA12T7Y=	Euro	United St	Corporate	India - N	Pay at Ma	2915179		50.1296		No
20	DE000A12T8U5(SP)	DE000A12T8U5	Aareal Ba	ATCBCA	1.43	2025/8/1	2016/3/23	DEA12T7Y=	Euro	United St	Corporate	India - N	Pay at Ma	5487534		50.1296		No
21	DE000A12T8V3(SP)	DE000A12T8V3	Aareal Ba	ATCBCA	1.43	2025/8/1	2016/3/23	DEA12T7Y=	Euro	United St	Corporate	Note	Plain Var	5.5E+08	Investmer	88.5446		No
22	DE000A12T8G4(SP)	DE000A12T8G4	Aareal Ba	ATCBCA	1.43	2025/8/1	2016/3/23	DEA12T7Y=	Euro	United St	Corporate	Note	Plain Var	6.5E+08	Investmer	88.5446		No
23	DE000A12T8N0(SP)	DE000A12T8N0	Aareal Ba	ATCBCA	1.43	2025/8/1	2016/3/23	DEA12T7Y=	Euro	United St	Corporate	Note	Plain Var	8.5E+08	Investmer	88.5446		No
24	DE000A12T796(SP)	DE000A12T796	Aareal Ba	ATCBCA	1.43	2025/8/1	2016/3/23	DEA12T7Y=	Euro	United St	Corporate	Note	Plain Var	5.71E+08	Investmer	88.5446		No
25	DE000A12T7N2(SP)	DE000A12T7N2	Aareal Ba	ATCBCA	1.43	2025/8/1	2016/3/23	DEA12T7Y=	Euro	Eurobond	Corporate	Note	Plain Var	5.71E+08	Investmer	88.5446		No
26	US002824BM11(SP)	US002824BM11	Abbott La	ABT	3.875	2025/9/15	2017/3/22	002824BM1	US Dollar	United St	Corporate	Note	Plain Var	5E+08	Investmer	88.5446		No
27	US002824BF69(SP)	US002824BF69	Abbott La	ABT	3.875	2025/9/15	2017/3/22	002824BM1	US Dollar	United St	Corporate	Note	Plain Var	5E+08	Investmer	88.5446		No
28	US002824BG43(SP)	US002824BG43	Abbott La	ABT	3.875	2025/9/15	2017/3/22	002824BM1	US Dollar	United St	Corporate	Note	Plain Var	1.64E+08		69.2965	CBI Align	Yes
29	US002824BN93(SP)	US002824BN93	Abbott La	ABT	3.875	2025/9/15	2017/3/22	002824BM1	US Dollar	United St	Corporate	Bond	Plain Var	14845944		34.156		No
30	US002824BH26(SP)	US002824BH26	Abbott La	ABT	3.875	2025/9/15	2017/3/22	002824BM1	US Dollar	United St	Corporate	Note	Plain Var	3.43E+08	Investmer	69.7272		No
31	US00287YAY59(SP)	US00287YAY59	AbbVie Ir	ABBV	3.2	2026/5/14	2016/5/12	00287YAY5	US Dollar	United St	Corporate	Note	Fixed Mar	1.46E+08		84.5029		No
32	XS1520907814(SP)	XS1520907814	AbbVie Ir	ABBV	3.2	2026/5/14	2016/5/12	00287YAY5	US Dollar	United St	Corporate	Note	Fixed Mar	2.14E+08		84.5029		No
33	US00287YAR09(SP)	US00287YAR09	AbbVie Ir	ABBV	3.2	2026/5/14	2016/5/12	00287YAY5	US Dollar	United St	Corporate	Inhabersc	Plain Var	22839915	Investmer	61.2189		No
34	US00287YAV11(SP)	US00287YAV11	AbbVie Ir	ABBV	3.2	2026/5/14	2016/5/12	00287YAY5	US Dollar	United St	Corporate	Inhabersc	Plain Var	22839915	Investmer	61.2189		No

code. It should be like the graph below:

- **5. Merge the processed files:** After completing the above steps for each individual year, consolidate all yearly datasets into a single workbook so that every processed file, organized by year.

I did this process on corporate bonds that have coupons larger than zero, equals to zero, and on sovereign bonds.

- ## Addition Notes on Bonds:

Below are the explanations from LSEG that show how to calculate the variables.

- Spreads:

SP - G-Spread (over Government Benchmark Curve)

Notes To calculate datatype SP the maturity (datatype LF) and yield (datatype RY) of a bond is compared with the equivalent government benchmark bond for the bond's currency of denomination. The spread is expressed as yield difference (bond minus benchmark) in basis points.

Because the maturities for most of the bonds for which the spread is calculated will not exactly match the maturity of the available government benchmark bonds, linear interpolation is used to estimate the yield of a government benchmark with the same maturity as the bond which is analysed (datatype EBRY). For bonds with a maturity longer than the longest benchmark, the yield is compared to the longest benchmark and not extrapolated. Similarly, bonds with maturities shorter than the shortest benchmark are compared to the shortest available benchmark.

Click here for an example spread calculation.

- Prices(Composite MID)：

CMPM - Price - Composite MID

Explorers Bonds & Convertibles » Key Datatypes
Bonds & Convertibles » Datastream

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Notes

Composite Mid (CMPM)

Thomson Reuters receive bond prices from multiple contributors. The bid and ask (CMPB & CMPA) composite values will be the average from all the available contributors bid and ask quotes.

The composite Mid value is simply the mid of the composite Bid (CMPB) and composite ask (CMPA) values.

Methodology

The methodology is as follows:

Number of Contributors	Methodology
0	No composite price available.
1	The bid and ask composite will be the bid and ask from the contributor.
2	The bid and ask composite values will be the average from the contributors bid and ask quotes.
3	The composite is calculated using the following method: · Average all bid and ask to create an arithmetic bid and ask mean. · Determine which contributor's bid and ask is farthest from the calculated mean, and exclude those contributors from the Thomson Reuters composite. · The bid and ask composite will be the average bid and ask from the remaining two contributors.
4 or more	The composite will be calculated using the following method: · The highest and the lowest bid and ask values are deleted. · The remaining bid and ask values are averaged to produce the Thomson Reuters composite.

Other key quality points on the Thomson Reuters Composite methodology are:

1. The composite excludes a source on an individual bond basis, or exclude a contributor source from the calculation due to quality issues or if the contributor follows a different price convention. For example, Convertible bonds can be priced in nominal or percentage terms.
2. The composite price is rounded to two decimal digits.
3. "Mixed Contributed Values" will be converted to price type quotations. These bonds contain quotations, expressed as yields and prices. The bid and ask yields are converted to prices.
4. The Thomson Reuters Composite is regionally-based. Each contributor is assigned to one of the three regional composites (Europe, Asia or Americas) based on the region from which the quote was obtained.

- **Addition Notes on CDS:**

The procedure for downloading CDS data is the same as for bonds, so the detailed steps are omitted in this part. However, three important points should be noted:

1. After downloading the CDS list, you will obtain only the RICs (Reuters Instrument Codes) of the CDS, not the ISINs of the bonds. You should therefore use these RICs as symbols to download the required variables.
2. Only spread data is available for the time series; LSEG does not provide price data for CDS. Consequently, you can only retrieve spread data.
3. When downloading the list, you cannot filter in LSEG Workspace to determine whether a company issuing the CDS has ESG data. Thus, you should use the following formulas:
   First, use the following formula to get the underlying equity ISIN,
   =@DSGRID(B4,"CDSEQI","Latest Value","","","Sym=RIC")
   Then, use the following formula to ensure that it has an ESG score:
   =@DSGRID(D4,"TRESGS","Latest Value","","","Sym=ISIN")
   After that we can filter the CDS that have available underlying equity ISINs and corresponding ESG data（ESG score>0）, which allows us to carry out further analysis.

All other steps are identical to the bond procedure.

- **Control data with Bonds and CDS accessible from LSEG:**

The control data and ESG-related data used in previous paper (Campiglio et al., 2025) are as follows:

Control		ESG	
Code	NAME	Code	NAME
WC06011	Industry Group	ENERDP123	Estimated CO2 Equivalents Emission Total
GGISN	Country Of ISIN Issuer	ENERO03V	Total CO2 Equivalent Emissions To Revenues USD in millions
WC02999	Total Assets	ENERDP096	CO2 Equivalent Emissions Indirect, Scope 3
WC08291	EBIT/Total Interest Expense Ratio	ENSCORE	Environment Pillar Score
WC08326	Return On Assets	TRESGSOWOS	Workforce Score
WC08346	Tax Rate	TRESGENERS	Emissions Score
WC01001	Net Sales Or Revenues	ENERDP0161	Targets Emissions
WC08001	Market Capitalization	TRESGS	ESG Score
WC07011	Employees	ENERDP024	CO2 Equivalent Emissions Direct, Scope 1
WC08311	Cash Flow/Sales	ENERDP023	CO2 Equivalent Emissions Total

And other Commodities as follows:

Code	NAME
CRUDOIL	Crude Oil-WTI Spot Cushing U$/BBL
OILWTIN	Crude Oil WTI Cushing U$/BBL
EIAEBRT	Europe Brent Spot FOB U$/BBL Daily
CRUDBFO	BFO Europe FOB
BFO1MEU	Crude Oil BFO M1 Europe FOB $/Bbl
NATGAS1	NYMEX Natural Gas Henry Hub C1
EIATXPR	Mont Belvieu TX Prop Spt FOB U$/GAL
PROUSMB	Propane Mont Belvieu Del. Pipe UC/GAL
U:SPH	SUBURBAN PROPANE PTNS.
PROPANE	Propane, Mt.Belvieu Cents/Gallon
PRONUVM	Propane C3 Mont Belvieu U$/Gal
PROCMED	Propane CIF MED Del. Term. U$/MT

For commodities, it is simple: just use the codes to download daily data by Datastream as the previous procedure shows you.

For the other control and ESG data for the bonds, note that these items fall under the datatype "Equities," whereas bonds and CDS do not share this datatype. Therefore, you should follow the procedure below to obtain the control data separately for bonds and CDS:

1. Before obtaining the data, create a list of equity ISINs that have ESG scores. For the bonds, use the following formulas:

   To obtain the Bond Ultimate Parent Company Datastream Equity Code:

   =@DSGRID(A3,"BUPCECD","Latest Value","","","Sym=ISIN")

   To obtain the corresponding equity ISINs:

   =@DSGRID(E2,"ISIN","Latest Value")

   After this step, you will have the list of underlying equity ISINs.

   For the CDS, since the underlying equity ISINs have already been retrieved, you can use them directly.

2. Download the control and ESG data for each equity ISIN via Datastream, one series at a time.
3. Use a VLOOKUP formula (too lengthy to display here; see the worksheet with the suffix "processed") to match these obtained data to the bonds' ISINs and the CDS RICs.

- **Other control data: Market, Size and Value**

`Use the website: https://jkpfactors.com/factor-returns. Choose the filters "All countries," "Daily," and "Capped Value Weighted (Recommended)." Then, in the Theme/Factor filter, select and download "Market," "Size," and "Value" respectively.

You can find the documentation and labels in the folder "mkt&size&value."